

STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES &
ENVIRONMENTAL CONTROL
DIVISION OF WATER RESOURCES
89 KINGS HIGHWAY
DOVER, DELAWARE 19901

FACT SHEET

Formosa Plastics Corporation Delaware
Schoolhouse Road
P.O. Box 320
Delaware City, Delaware 19706

NPDES Permit DE 0000612
State Permit No. WPCC 3025F/75

Formosa Plastics Corporation has applied for reissuance of its National Pollutant Discharge Elimination System (NPDES) permit to discharge biologically treated waste waters and treated storm water runoff combined with neutralized boiler blowdown, reverse osmosis concentrate, deionizer regeneration, and incinerator waste waters to the Delaware River. Storm water runoff from non-contained areas is conveyed to Red Lion Creek and Dragon Run Creek.

Facility Location

This facility is located at 780 Schoolhouse Road, in Delaware City, New Castle County, Delaware as shown in the attached permit.

Permit Changes

The following summarizes proposed permit changes.

1. Added lat./longs. for Outfalls to page 2 of the permit.
2. Added influent monitoring for BOD₅ and TSS to Part I.B.1 and Special Conditions No. 2 and (new) No. 3, to verify that requirements are met regarding 87.5% removal of BOD₅ and 85% for TSS.
3. Updated text of standard conditions, especially regarding filing of electronic Discharge Monitoring Reports (eDMR).
4. Added a standard condition in Part II.A.2 "Notifications Specific to Manufacturing, Commercial, Mining, and Silvicultural Dischargers".
5. Updated and consolidated text of old Special Conditions numbers 7 and 9 regarding PCB requirements into new Special Condition No. 9.
6. Removed special condition No. 8 which allowed reduction in PCB monitoring frequency. The current monitoring frequency of once annually is the minimum frequency allowed.
7. Added new special condition No. 6 per a recently promulgated EPA Rule requiring use of "Sufficiently Sensitive Test Methods." This is pursuant to 40 CFR part 136 to ensure the use of EPA-approved analytical methods that are capable of detecting and measuring the pollutants at, or below, the applicable water quality criteria or permit limits.

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Pre-Public Notice Draft – June 23, 2017

8. Changed biomonitoring “pass” concentration from “100% effluent” to “13.4% effluent”.
9. Added new Special Condition 7 which requires the Department to evaluate biomonitoring test data after the first year of the permit and develop Whole Effluent Toxicity (WET) limits if necessary.
10. Added new Special Condition No. 14 which requires proper licensing of the waste water treatment facility operator.

Activity Description

The facility manufactures polyvinyl chloride resins from vinyl chloride monomer.

Description of Discharge

Four (4) outfalls (001, 002, 003, and 004) are identified in the permit. Outfall 001 consists of: 1) effluent from the biological wastewater treatment plant which treats cooling tower blowdown and overflow, process waste water, boiler blowdown, and storm water, and 2) neutralized reverse osmosis concentrate, deionizer or softener regeneration waste water, and incinerator waste waters. These components are combined in a neutralization basin and carried by a single pipe to the Motiva Sluiceway which discharges to the Delaware River. Outfall 002 consists of storm water runoff from parking lots and PVC loading area and discharges to Red Lion Creek. Outfall 003 consists of storm water runoff from truck loading docks at the south end of the Finished Goods Warehouse and discharges to Dragon Run Creek. Outfall 004 consists of storm water runoff from areas surrounding the wastewater treatment plant and the fire water ponds and discharges to Dragon Run Creek.



Receiving Stream Classification

The Delaware River is a tidal water body that can be either fresh or salt water in the area of Outfall 001. The designated uses of the Delaware River in the vicinity of the discharge are: Industrial Water Supply; Primary and Secondary Contact Recreation; and Maintenance of Fish, Aquatic Life, and Wildlife. Both the Red Lion Creek and the Dragon Run Creek are fresh tidal water bodies in the area of storm water Outfalls 002, 003, and 004. Both of these water bodies are listed for the same designated uses listed above for the Delaware River. Fresh water segments of Dragon Run and Red Lion Creek have two additional designated uses: public water supply and agricultural water supply.

Regulatory agencies classify water bodies according to their designated uses (eg., aquatic life protection, fishing, swimming, etc.). Agencies assess whether or not each water body supports ("attains") each of its designated uses, and report their assessments in "305(b)" Reports¹. When a stream is in nonattainment of a designated use, it is listed on a "303(d) List", which shows the causes of the impairment, and a schedule for agencies to address those impairments, usually via the TMDL² process. As part of a TMDL, the regulating agency would allocate allowable pollutant discharge amounts (if assimilative capacity is available) among industrial and municipal point source dischargers.

For the Delaware River, the current DRBC 305(b) Report³ shows "Not supported" for two designated uses: Aquatic Life and Fish Consumption.

¹ Called "305(b) Reports" because they are required under Section 305(b) of the Federal Clean Water Act.

² "TMDL" is the "Total Maximum Daily Load" from point, nonpoint, and natural background sources that a water body can assimilate and still support designated uses.

³ "2014 Delaware River and Bay Water Quality Assessment", Table 23, Page 47, Delaware River Basin Commission, August 2014. See [[HYPERLINK](http://liberty.state.nj.us/drbc/library/documents/WQAssessmentReport2014.pdf) "http://liberty.state.nj.us/drbc/library/documents/WQAssessmentReport2014.pdf"].

Table [SEQ Table * ARABIC]. 2015-'16 DELAWARE FISH CONSUMPTION ADVISORIES ¹				
WATERBODY	SPECIES	CONTAMINANT OF CONCERN	GEOGRAPHICAL EXTENT	MEALS/YR. (8-OUNCE SERVING)
All Waters not listed below	All species not listed below	All	All Areas not listed	52
Delaware River	All Finfish	A, B, E	Delaware State Line to the C&D Canal	1*
Lower Delaware River and Delaware Bay	Weakfish-all sizes, Bluefish-14 inches or less	A	Chesapeake & Delaware Canal to the Mouth of the Delaware Bay	12
	Bluefish-greater than 14 inches	A, C	Chesapeake & Delaware Canal to the Mouth of the Delaware Bay	1*
	Striped Bass, White Perch, American Eel, White Catfish, Channel Catfish	A	Chesapeake & Delaware Canal to the Mouth of the Delaware Bay	2*
Red Lion Creek	All Finfish	A, B	Route 1 to the Delaware River	2
		A, E	Upstream of Route 1	12
<p>* Women of childbearing age and children should not consume any amount of these fish. For more information on the specific contaminant(s) of concern for each waterbody listed, consult the Division's website (www.fw.delaware.gov) or contact DNREC at (302) 739-9902, or the Division of Public Health at (302) 744-4546.</p> <p>Contaminants of concern:</p> <p>A) PCBs, B) Dioxins and furans, C) Mercury, D) Chlorinated pesticides, E) Dieldrin, F) DDT, DDD and DDE, G) Chlordane</p>				

¹ [HYPERLINK "http://www.dnrec.delaware.gov/fw/Fisheries/Documents/2015-16_Delaware_Fish_Consumption_Advisories.pdf"]

**Table [SEQ Table * ARABIC]. – FINAL DETERMINATION FOR THE STATE OF DELAWARE 2014 CLEAN WATER ACT
SECTION 303(d) LIST OF WATERS NEEDING TMDLs ¹**

SEGMENT	DESCRIPTION	SIZE	POLLUTANT OR STRESSOR	PROBABLE SOURCE(S)	YEAR LISTED	TARGET DATE FOR TMDL	TMDL DATE	Pollutant CALM Code	Year Changed from Category 5 Per 305(b) Assessment and Methodology	Notes
Delaware River, Zone 5	From the Pennsylvania-Delaware line to Liston Point, Delaware.	59.0 sq. mi.	Bacteria	PS, NPS	1996	2005		1		Bacteria , listed in 1996, delisted 2004 based on 2004 DRBC 305(b) assessment
			PCBs	PS, NPS, SF	1996	2005	2003	4a	2006	
			Arsenic		2002			1	2006	Not a contaminant of concern in fish consumption advisories for these waters
			Dioxin		2002	2017		5		TMDL Target date changed from 2011 to 2017 in the 2012 Cycle, per the WATAR plan in the appendix
			Mercury		2002	2016		1	2014	Mercury, Listed 2002, Delisted 2014, not a contaminant of concern in fish consumption advisories for these waters.
			Chlorinated Pesticides	PS, NPS, SF	2002	2011		5		TMDL Target date changed from 2011 to 2017 in the 2012 Cycle, per the WATAR plan in the appendix
			Chronic Toxicity (DRBC Zones 5a and 5b, 25 sq miles)		2002			1		Bioassays performed in 2005, 2007, and 2008 indicate no chronic toxicity in Zone 5 mainstem samples. Chronic toxicity, listed in 2002, Delisted in 2012 based on 2011 journal article.
			Iron		2004			3		Surface water levels of iron in the segment sometimes exceed the applicable criterion. The Department believes further study of surface water iron levels and a determination of whether a use impairment is resulting from those levels is an appropriate response to the available information.
Delaware River, Zone 5c	Lower portion of DRBC Zone 5	31 sq. mi.	DO	PS, NPS	2006	2019		5		Delaware will work with the DRBC, EPA, other States and Stakeholders to develop and implement a TMDL in these waters.
Lower Red Lion Creek	From U.S. Route 13 to the mouth at Delaware River	1.5 miles	DO	NPS	1996	2006	2006	4a	2008	
			Nutrients	NPS	1996	2006	2006	1	2008	Nutrients, Listed 1996, Delisted 2012
			Chlorinated Benzenes		1996			1	2002	Chlorinated Benzene, listed in 1996, delisted 2002 based on improved conditions.
			Bacteria	NPS	2002	2006	2006	4a	2008	
			PCBs	NPS	2002	2006	2006	4a	2012	EPA TMDL for PCBs in Delaware River Zone 6 and tributaries
			Dioxins	NPS	2002	2017		5		TMDL Target date changed from 2011 to 2017 in the 2012 Cycle, per the WATAR plan in the appendix
			Chronic Toxicity	NPS, PS	2012	2025		5		Listed Based on 2011 journal article. Likely cause is a federal superfund site. The Department is working with EPA on the cleanup and possible TMDL.
Lower Dragon Run	From dam at the water supply pond to the mouth of Delaware River	3.2 miles	Nutrients	NPS	1998	2006	2006	1	2008	Nutrients, Listed 1998, Delisted 2012
			DO	NPS	1998	2006	2006	4a	2008	
			Bacteria	NPS	2002		2006	1	2008	Bacteria, listed 2002, delisted 2006, relisted 2008, Delisted 2010

¹ "State of Delaware 2014 Combined Watershed Assessment Report (305(b)) and Determination for the Clean Water Act Section 303(d) List of Waters Needing TMDLs", pages 125 and 126, Dept. of Natural Resources and Environmental Control, April 2015. See [[HYPERLINK](#)

"<http://www.dnrec.delaware.gov/swc/wa/Documents/WAS/dave%27s%20docs/2014%20Delaware%20Integrated%20305%28b%29-303%28d%29%20Final.pdf>"]

KEY for CALM Code¹	1 = Fully Supporting for this parameter 3 = Information is insufficient to make a determination 4a = TMDL has been completed and approved by EPA 4b = Management Actions are expected to solve impairment 5 = TMDL Needed	KEY for Probable Source(s):	NPS = Nonpoint Source(s) PS = Point Source(s) SF = Superfund Site(s)
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Statutory and Regulatory Basis

The Delaware Department of Natural Resources and Environmental Control (DNREC) proposes to reissue the company a NPDES permit to discharge wastewater subject to certain effluent limitations identified in the attached permit. Section 402 of the Federal Clean Water Act of 1977, as amended and 7 Del. C., Chapter 60 provide the authority for NPDES permit issuance. Regulations promulgated pursuant to these statutes are the regulatory basis for permit issuance.

Proposed Effluent Limitations

DNREC has examined the application, recent discharge monitoring data, and related information and proposes to reissue the facility's NPDES permit for a period not to exceed five (5) years, subject to the effluent discharge limitations and monitoring requirements shown in the attached permit. The following table outlines the bases for the proposed effluent limitations.

The permittee submitted NPDES Application Form 2C for Outfall 001 and Form 2F for storm water Outfalls 003 and 004. Outfalls 003 and 004 were sampled as "substantially identical to and representative of"² Outfall 002. The "[HYPERLINK "http://www.epa.gov/npdes/pubs/owm0264.pdf"]"³ (TSD), provides a methodology for a "Reasonable Potential" (RP) Analysis to identify which parameters have a reasonable potential to cause or contribute to water quality problems in the receiving waters. The RP Analysis uses data from renewal applications and monthly Discharge Monitoring Reports (DMR) and compares them to all applicable technology-based standards and State water quality standards. State tech. standards are in the Regulations Governing the Control of Water Pollution (RGCWP), §7.1. Federal tech. standards are in the Effluent Limitation Guidelines (ELGs). Technology-based standards are a minimum level of treatment required for NPDES discharges, considering wastewater treatment technologies. When multiple technology and water-quality based standards exist for a specific pollutant, the NPDES permit limit is based upon the requirement that results in the strictest limit.

Table [SEQ Table * ARABIC]. – Dilution Factors (DF) and Instream Waste Concentrations (IWC) Used in Reasonable Potential Analysis		
Regulatory Mixing Zone	DF	IWC
Acute Mixing Zone	7.45	13.43%
Chronic Mixing Zone	754.59	0.133%
Farfield, Systemic Pollutants	6,569.45	0.0%
Farfield, Carcinogenic Pollutants	20,034.78	0.0%

¹ CALM is "Consolidated Assessment and Listing Methodology", Ibid., Page 143

² "When an applicant has two or more outfalls with substantially identical effluents, the Director may allow the applicant to test only one outfall and report that quantitative data as applying to the substantially identical outfall." See 40 CFR [HYPERLINK "http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&sid=17a8e2eee7293fc7259f0dfec5fb7df5&rgn=div8&view=text&node=40:21.0.1.1.12.2.6.1&idno=40"].

³ U.S.E.P.A., Office of Water (EN-336), March, 1991, EPA/505/2-90-001, PB91-127415

The table below summarizes the results of that Reasonable Potential analysis.

Table [SEQ Table * ARABIC]. – Summary of Reasonable Potential Analysis Results					
Pollutant	Max. Effluent Conc.(ppm)	WLA ¹ for Effluent Conc. (ppm)	Limit or Monitoring Needed?	Limiting Criteria	Effluent Conc. as % of WLA
BOD	12	24		ELG	50%
TSS	7	30		Tech	23%
Ammonia (as N)	2.59	268.85			1%
pH, minimum (SU)	6.5	6.5	Monit.	Tech	100%
pH, maximum (SU)	8.5	9		ELG	94%
Phosphorous	0.157				
Surfactants	0.05				
Acrylonitrile	< 0.00064	0.0649	Monit.	ELG	1%
Benzene	< 0.00012	0.0299		ELG	0%
Carbon tetrachloride	< 0.00013	0.0415		ELG	0%
Chlorobenzene	< 0.00011	0.0402		ELG	0%
Chloroethane	< 0.00079	0.0722		ELG	1%
Chloroform	0.011	0.0355		ELG	31%
1,1-Dichloroethane	< 0.00032	0.0150		ELG	2%
1,2-Dichloroethane	< 0.00026	0.0727		ELG	0%
1,1-Dichloroethylene	< 0.00033	0.01231		ELG	3%
1,2-Dichloropropane	< 0.00014	0.1143		ELG	0%
1,3-Dichloropropylene	< 0.00015	0.0592		ELG	0%
Ethylbenzene	< 0.00012	0.04775		ELG	0%
Methyl chloride	< 0.0009	0.0642		ELG	2%
Methylene Chloride	< 0.0005	0.0263		ELG	0%
Tetrachloroethylene	< 0.00031	0.0221		ELG	1%
Toluene	< 0.00011	0.0182		ELG	1%
1,2-Trans-Dichloroethylene	< 0.00029	0.015		ELG	2%
1,1,1-Trichloroethane	< 0.00051	0.0145		ELG	4%
1,1,2-Trichloroethane	< 0.00029	0.0169		ELG	2%
Trichloroethylene	< 0.00034	0.0155		ELG	2%
Vinyl Chloride	0.00068	0.0691		ELG	1%
2-Chlorophenol	< 0.00047	0.0138		ELG	3%
2,4-Dichlorophenol	< 0.00057	0.0173		ELG	3%
2,4-Dimethylphenol	< 0.0008	0.0125		ELG	6%
4,6-Dinitro-O-Cresol	< 0.00064	0.05308		ELG	1%
2,4-Dinitrophenol	< 0.00095	0.3166		ELG	0%
2-Nitrophenol	< 0.0006	0.03357		ELG	2%
4-Nitrophenol	< 0.00056	0.07025		ELG	1%
Phenol	< 0.00033	0.0112		ELG	3%
Acenaphthene	< 0.00076	0.0143		ELG	1%
Acenaphthylene	< 0.00064	0.0143		ELG	5%

¹ WLA is "Waste Load Allocation", the strictest applicable criteria, as calculated at the end of the discharge pipe. A blank in the WLA column means there are no applicable numeric criteria for the parameter.

Table [SEQ Table * ARABIC]. – Summary of Reasonable Potential Analysis Results					
Pollutant	Max. Effluent Conc.(ppm)	WLA ¹ for Effluent Conc. (ppm)	Limit or Monitoring Needed?	Limiting Criteria	Effluent Conc. as % of WLA
Anthracene	< 0.00068	0.0143		ELG	5%
Benzo(a)Anthracene	< 0.00067	0.0143		ELG	5%
Benzo(a)Pyrene	< 0.00056	0.0149		ELG	4%
3,4-Benzofluoranthene	< 0.00085	0.0149		ELG	6%
Benzo(k)fluoranthene	< 0.0005	0.0143		ELG	4%
Bis(2-Ethylhexyl)Phthalate	< 0.00082	0.0682		ELG	1%
Chrysene	< 0.00064	0.0143		ELG	4%
1,2-Dichlorobenzene	< 0.00014	0.0805		ELG	0%
1,3-Dichlorobenzene	< 0.00014	0.0473		ELG	0%
1,4-Dichlorobenzene	< 0.00014	0.0402		ELG	0%
Diethyl Phthalate	< 0.00069	0.0469		ELG	1%
Dimethyl Phthalate	< 0.0015	0.0129		ELG	12%
Di-N-Butyl Phthalate	< 0.00065	0.0167		ELG	4%
2,4-Dinitrotoluene	< 0.00066	0.050		ELG	1%
2,6-Dinitrotoluene	< 0.00069	0.1133		ELG	1%
Fluoranthene	< 0.0006	0.0163		ELG	4%
Fluorene	< 0.00066	0.0143		ELG	5%
Hexachlorobenzene	< 0.00094	0.0056		HH-Fish Ing., carcin.	17%
Hexachlorobutadiene	< 0.00128	0.0424		ELG	3%
Hexachloroethane	< 0.00093	0.0556		ELG	2%
Naphthalene	< 0.0008	0.0143		ELG	6%
Nitrobenzene	< 0.00081	0.5402		ELG	0%
Phenanthrene	< 0.0007	0.0143		ELG	5%
Pyrene	< 0.00057	0.0158		ELG	4%
1,2,4-Trichlorobenzene	< 0.00088	0.0765		ELG	1%

In short, the pollutants identified as needing limits already have appropriate limits in the permit. The limiting requirements in most cases are the technology-based standards in Federal Effluent Limitation Guidelines (ELG's) in 40 CFR "Part 414-Organic Chemical, Plastics, and Synthetic Fibers" [NOTEREF _Ref228262555 \h * MERGEFORMAT] (OCPSF).

Table [SEQ Table * ARABIC]. – Outfall 001, Bases for Effluent Limits						
Parameter	Water Quality - Based	Technology-Based				
		Effluent Limitation Guidelines (ELGs) ³			Performance-Based ⁴	RG CW P ⁵
		[HYPERLINK "http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&sid=69fea1a8ef245ab360d9c8dfd9390edb&rgn=div8&view=text&node=40:28.0.1.1.14.4.3.2&idno=40"]	[HYPERLINK "http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&sid=69fea1a8ef245ab360d9c8dfd9390edb&rgn=div8&view=text&node=40:28.0.1.1.14.9.3.2&idno=40"]	[HYPERLINK "http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&sid=69fea1a8ef245ab360d9c8dfd9390edb&rgn=div8&view=text&node=40:28.0.1.1.14.10.3.2&idno=40"]		
Flow (mgd)					✓	
BOD		✓				
TSS		✓				
pH (SU)	✓					
Temperature, °F	✓					
Surfactants	✓					
GC/MS Fraction - Volatile Compounds						
Acrylonitrile			✓	✓		
Benzene			✓	✓		
Carbon tetrachloride			✓	✓		
Chlorobenzene			✓	✓		

¹ 7 Del. Code, §7401, "Surface Water Quality Standards" (SWQS), Effective October 11, 2014, [HYPERLINK "http://regulations.delaware.gov/AdminCode/title7/7000/7400/7401.pdf"].

² Delaware River Basin Commission (DRBC) regulations specify a temperature limit of 110°F, which is applied at the final discharge from the Delaware City Refinery Sluiceway to the Delaware River.

³ Federal Effluent Limitation Guidelines (ELG's) are from 40 CFR "Part 414-Organic Chemical, Plastics, and Synthetic Fibers" (OCPSF). "Subpart D - Thermoplastic Resins (40 CFR 414.41) lists ELG's for conventional pollutants. "Subpart J - Direct Discharge Point Sources That Use End-of-Pipe Biological Treatment" (40 CFR §414.91) and "Subpart J - Direct Discharge Point Sources That Do Not Use End-of-Pipe Biological Treatment" (40 CFR §414.101) list ELG's for toxic pollutants. Where more than one ELG applies, they are averaged in proportion to process flow rates (see discussion on page 10 below).

⁴ Performance-based limits are based on the provisions of 40 CFR 122.45(b)(2)(I).

⁵ §7.3, "Minimum Requirements for Treatment of Any Liquid Waste Prior to Discharge to a Surface Water", "State of Delaware Regulations Governing the Control of Water Pollution" (RGCWP), as amended September 1, 2012, [HYPERLINK "http://regulations.delaware.gov/AdminCode/title7/7000/7200/7201.pdf"]

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		[HYPERLINK "http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&sid=69fea1a8ef245ab360d9c8dfd9390edb&rgn=div8&view=text&n ode=40:28.0.1.1.14.4.3.2&idno=40"]	[HYPERLINK "http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&sid=69fea1a8ef245ab360d9c8dfd9390edb&rgn=div8&view=text&n ode=40:28.0.1.1.14.9.3.2&idno=40"]	[HYPERLINK "http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&sid=69fea1a8ef245ab360d9c8dfd9390edb&rgn=div8&view=text&n ode=40:28.0.1.1.14.10.3.2&idno=40"]		
nzene						
Chloroethane			✓	✓		
Chloroform			✓	✓		
1,1-Dichloroethane			✓	✓		
1,2-Dichloroethane			✓	✓		
1,1-Dichloroethylene			✓	✓		
1,2-Dichloropropane			✓	✓		
1,3-Dichloropropylene			✓	✓		
Ethylbenzene			✓	✓		
Methylchloride			✓	✓		
Methylene Chloride			✓	✓		

Table [SEQ Table * ARABIC]. – Outfall 001, Bases for Effluent Limits						
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		Effluent Limitation Guidelines (ELGs) ³			Performance-Based ⁴	RG CW ⁵
		[HYPERLINK "http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&sid=69fea1a8ef245ab360d9c8dfd9390edb&rgn=div8&view=text&node=40:28.0.1.1.14.4.3.2&idno=40"]	[HYPERLINK "http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&sid=69fea1a8ef245ab360d9c8dfd9390edb&rgn=div8&view=text&node=40:28.0.1.1.14.9.3.2&idno=40"]	[HYPERLINK "http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&sid=69fea1a8ef245ab360d9c8dfd9390edb&rgn=div8&view=text&node=40:28.0.1.1.14.10.3.2&idno=40"]		
Tetrachloroethylene			✓	✓		
Toluene			✓	✓		
1,2-Trans-Dichloroethylene			✓	✓		
1,1,1-Trichloroethane			✓	✓		
1,1,2-Trichloroethane			✓	✓		
Trichloroethylene			✓	✓		
Vinyl Chloride			✓	✓		

Table [SEQ Table * ARABIC]. – Outfall 001, Bases for Effluent Limits							
Parameter	Water Quality - Based ¹	Technology-Based					
		Effluent Limitation Guidelines (ELGs) ³				Performance-Based ⁴	RG CW P ⁵
		[HYPERLINK "http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&sid=69fea1a8ef245ab360d9c8dfd9390edb&rgn=div8&view=text&node=40:28.0.1.1.14.4.3.2&idno=40"]	[HYPERLINK "http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&sid=69fea1a8ef245ab360d9c8dfd9390edb&rgn=div8&view=text&node=40:28.0.1.1.14.9.3.2&idno=40"]	[HYPERLINK "http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&sid=69fea1a8ef245ab360d9c8dfd9390edb&rgn=div8&view=text&node=40:28.0.1.1.14.10.3.2&idno=40"]			
GC/MS Fraction - Acid Compounds							
2-Chlorophenol				✓			
2,4-Dichlorophenol				✓			
2,4-Dimethylphenol				✓	✓		
4,6-Dinitro-Cresol				✓	✓		
2,4-Dinitrophenol				✓	✓		
2-Nitrophenol				✓	✓		
4-Nitrophenol				✓	✓		
Phenol				✓	✓		
GC/MS Fraction - Base Neutral Compounds							
Acetophenone				✓	✓		
Acetophenone				✓	✓		

Table [SEQ Table * ARABIC]. – Outfall 001, Bases for Effluent Limits						
Parameter	Water Quality - Based	Technology-Based				
		Effluent Limitation Guidelines (ELGs) ³			Performance-Based ⁴	RG CW P ⁵
		[HYPERLINK "http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&sid=69fea1a8ef245ab360d9c8dfd9390edb&rgn=div8&view=text&node=40:28.0.1.1.14.4.3.2&idno=40"]	[HYPERLINK "http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&sid=69fea1a8ef245ab360d9c8dfd9390edb&rgn=div8&view=text&node=40:28.0.1.1.14.9.3.2&idno=40"]	[HYPERLINK "http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&sid=69fea1a8ef245ab360d9c8dfd9390edb&rgn=div8&view=text&nnode=40:28.0.1.1.14.10.3.2&idno=40"]		
hylene						
Anthracene			✓	✓		
Benzo (a) Anthracene			✓	✓		
Benzo (a) Pyrene			✓	✓		
3,4-Benzofluoranthene			✓	✓		
Benzo (k) fluoranthene			✓	✓		
Bis (2-Ethylhexyl) Phthalate			✓	✓		
Chrysene			✓	✓		
1,2-Dichlorobenzene			✓	✓		
1,3-Dichlorobenzene			✓	✓		

Table [SEQ Table * ARABIC]. – Outfall 001, Bases for Effluent Limits						
Parameter	Water Quality Based	Technology-Based				
		Effluent Limitation Guidelines (ELGs) ³			Performance-Based ⁴	RGCW ⁵
		[HYPERLINK "http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&sid=69fea1a8ef245ab360d9c8dfd9390edb&rgn=div8&view=text&node=40:28.0.1.1.14.4.3.2&idno=40"]	[HYPERLINK "http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&sid=69fea1a8ef245ab360d9c8dfd9390edb&rgn=div8&view=text&node=40:28.0.1.1.14.9.3.2&idno=40"]	[HYPERLINK "http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&sid=69fea1a8ef245ab360d9c8dfd9390edb&rgn=div8&view=text&nnode=40:28.0.1.1.14.10.3.2&idno=40"]		
ene						
1,4-Dichlorobenzene			✓	✓		
Diethyl Phthalate			✓	✓		
Dimethyl Phthalate			✓	✓		
Di-N-Butyl Phthalate			✓	✓		
2,4-Dinitrobenzene			✓			
2,6-Dinitrobenzene			✓			
Fluorene			✓	✓		
Fluorene			✓	✓		
Hexachlorobenzene			✓	✓		
Hexachlorobenzene			✓	✓		

Table [SEQ Table * ARABIC]. – Outfall 001, Bases for Effluent Limits						
Parameter	Water Quality - Based	Technology-Based				
		Effluent Limitation Guidelines (ELGs) ³			Performance-Based ⁴	RG CW P ⁵
		[HYPERLINK "http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&sid=69fea1a8ef245ab360d9c8dfd9390edb&rgn=div8&view=text&node=40:28.0.1.1.14.4.3.2&idno=40"]	[HYPERLINK "http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&sid=69fea1a8ef245ab360d9c8dfd9390edb&rgn=div8&view=text&node=40:28.0.1.1.14.9.3.2&idno=40"]	[HYPERLINK "http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&sid=69fea1a8ef245ab360d9c8dfd9390edb&rgn=div8&view=text&nnode=40:28.0.1.1.14.10.3.2&idno=40"]		
orobutadiene						
Hexachloroethane			✓	✓		
Naphthalene			✓	✓		
Nitrobenzene			✓	✓		
Phenanthrene			✓	✓		
Pyrene			✓	✓		
1,2,4-Trichlorobenzene			✓	✓		

Federal Effluent Limitation Guidelines (ELGs) regulations under 40 CFR [HYPERLINK

"http://www.ecfr.gov/cgi-bin/retrieveECFR?gp=&SID=91fcc73d54b24c898d9365feaf942bc0&mc=true&n=pt40.29.414&r=PART&ty=HTML"], "Organic Chemicals, Plastics, and Synthetic Fibers" (OCPSF), require limits and monitoring for 55 different organic chemicals. For Formosa, the applicable ELGs are in 40 CFR §414, Subparts D, I and J:

[HYPERLINK "http://www.ecfr.gov/cgi-bin/retrieveECFR?gp=&SID=91fcc73d54b24c898d9365feaf942bc0&mc=true&n=pt40.29.414&r=PART&ty=HTML" \ "sp40.29.414.d"]

[HYPERLINK "http://www.ecfr.gov/cgi-bin/retrieveECFR?gp=&SID=91fcc73d54b24c898d9365feaf942bc0&mc=true&n=pt40.29.414&r=

PART&ty=HTML" \l "se40.29.414_140"]
[HYPERLINK "http://www.ecfr.gov/cgi-bin/retrieveECFR?gp=&SID=91fcc73d54b24c898d9365feaf942bc0&mc=true&n=pt40.29.414&r=PART&ty=HTML" \l "se40.29.414_141"]
[HYPERLINK "http://www.ecfr.gov/cgi-bin/retrieveECFR?gp=&SID=91fcc73d54b24c898d9365feaf942bc0&mc=true&n=pt40.29.414&r=PART&ty=HTML" \l "se40.29.414_142"]
[HYPERLINK "http://www.ecfr.gov/cgi-bin/retrieveECFR?gp=&SID=91fcc73d54b24c898d9365feaf942bc0&mc=true&n=pt40.29.414&r=PART&ty=HTML" \l "se40.29.414_143"]

[HYPERLINK "http://www.ecfr.gov/cgi-bin/retrieveECFR?gp=&SID=91fcc73d54b24c898d9365feaf942bc0&mc=true&n=pt40.29.414&r=PART&ty=HTML" \l "sp40.29.414.i"]

[HYPERLINK "http://www.ecfr.gov/cgi-bin/retrieveECFR?gp=&SID=91fcc73d54b24c898d9365feaf942bc0&mc=true&n=pt40.29.414&r=PART&ty=HTML" \l "se40.29.414_190"]
[HYPERLINK "http://www.ecfr.gov/cgi-bin/retrieveECFR?gp=&SID=91fcc73d54b24c898d9365feaf942bc0&mc=true&n=pt40.29.414&r=PART&ty=HTML" \l "se40.29.414_191"]

[HYPERLINK "http://www.ecfr.gov/cgi-bin/retrieveECFR?gp=&SID=91fcc73d54b24c898d9365feaf942bc0&mc=true&n=pt40.29.414&r=PART&ty=HTML" \l "sp40.29.414.j"]

[HYPERLINK "http://www.ecfr.gov/cgi-bin/retrieveECFR?gp=&SID=91fcc73d54b24c898d9365feaf942bc0&mc=true&n=pt40.29.414&r=PART&ty=HTML" \l "se40.29.414_1100"]
[HYPERLINK "http://www.ecfr.gov/cgi-bin/retrieveECFR?gp=&SID=91fcc73d54b24c898d9365feaf942bc0&mc=true&n=pt40.29.414&r=PART&ty=HTML" \l "se40.29.414_1101"]

The usual EPA-approved tests for these chemicals use Gas Chromatograph & Mass Spectrometer (GC/MS). The 55 OCPSF chemicals are grouped according to how the samples are prepared and tested with the GC/MS: volatiles (21), acid extractables (8), and base-neutral extractables (26). These groupings were considered in judgments for proposed monitoring frequencies.

OCPSF regulations under 40 CFR 414.91 and 414.101 do have ELG's for metals, but the regulations note that these ELG's apply only to wastewater streams specifically listed in Appendix A of the regulation. The permit does not include metals limits since none of the wastewater streams listed in that appendix apply to any of Formosa's OCPSF wastewater streams, or Formosa's non-OCPSF streams: boiler blowdown, deionizer wash water, and reverse osmosis reject water.

Concentration limits for the ELG-based limits for the organic parameters are based on the weighted average of wastewater flows (Thermoplastic Resins wastewater, nonbiologically treated OCPSF

wastewater, biologically treated OCPSF wastewater, and) times the applicable ELG for that category of wastewater.

$$\text{Limit} = \frac{(\text{Thermoplastic Resins})(\text{ELG}_{414.41}) + (\text{OCPSF}_{\text{Nonbio. treated}})(\text{ELG}_{414.71}) + (\text{OCPSF}_{\text{Bio. treated}})(\text{ELG}_{414.101})}{\text{Total Wastewater Flow}}$$

The Formosa permit renewal application reports those flows as

Thermoplastic Resins process Wastewater =	0.23 mgd
OCPSF Process Wastewater (Nonbiologically Treated) =	0.17 mgd
OCPSF Process Wastewater (Biologically Treated) =	0.32 mgd

Biomonitoring

The site did a Toxicity Reduction Evaluation (TRE) in 2011-2013, and submitted a “Final Report on Implementation of Steps 2 & 3 of the Approved Toxicity Reduction Evaluation Plan.”¹ During implementation of steps 2 & 3 the site collected and reviewed biomonitoring reports, Discharge Monitoring reports (DMRs), laboratory analytical reports, and ecological toxicity data for wastewater treatment chemicals and utility water treatment chemicals. The site also reviewed manufacturing and production operations at the facility during the biomonitoring sampling periods, ecological toxicity data of key raw materials, information on the raw wastewater characteristics, and wastewater treatment plant performance. The site is currently implementing some of the recommendations made in the final report. Some of the key recommendations being implemented include minimizing discharge of latex material from the manufacturing process to the wastewater treatment plant, taking measures to keep coagulant dosages within acceptable ranges and ensuring adequate treatment of the discharge “red water” from the manufacture of copolymer products (products with vinyl chloride and vinyl acetate) before release.

The following Table summarizes results of whole effluent toxicity (WET) testing since the permit effective date.

¹ Report was submitted via cover letter dated July 19, 2013.

Table [SEQ Table * ARABIC] – Whole Effluent Toxicity (WET) Results, As “% Dead” of Test Organisms								
Sample Date	Mysidopsis Shrimp ¹	Sheepshead Minnow ²	Sample Date	Mysidopsis Shrimp	Sheepshead Minnow	Sample Date	Mysidopsis Shrimp	Sheepshead Minnow
3/8/2010	100%	100%	7/11/2012	0%	0%	2/23/2015	0%	0%
3/10/2010	100%	100%	7/13/2012	50%	0%	2/25/2015	0%	0%
3/12/2010	100%	0%	10/8/2012	0%	0%	2/27/2015	0%	0%
5/10/2010	100%	70.7%	10/10/2012	0%	0%	5/11/2015	0%	0%
8/2/2010	0%	0%	10/12/2012	0%	0%	5/13/2015	0%	0%
8/4/2010	0%	0%	2/4/2013	0%	0%	5/15/2015	0%	0%
8/6/2010	0%	0%	2/6/2013	0%	0%	8/3/2015	0%	0%
12/6/2010	100%	100%	2/8/2013	0%	0%	8/5/2015	0%	0%
12/8/2010	0%	0%	5/6/2013	100%	95%	8/7/2015	0%	0%
12/10/2010	0%	0%	5/8/2013	100%	5%	11/11/2015	0%	0%
3/7/2011	100%	0%	5/10/2013	0%	0%	11/13/2015	90%	0%
3/9/2011	0%	0%	8/7/2013	0%	0%	11/16/2015	0%	0%
3/11/2011	10%	0%	8/9/2013	0%	0%	3/28/2016	0%	0%
3/13/2011	0%	0%	8/12/2013	0%	0%	3/30/2016	0%	0%
6/13/2011	100%	0%	11/4/2013	0%	0%	4/1/2016	100%	0%
6/15/2011	0%	0%	11/6/2013	0%	0%	6/15/2016	0%	0%
6/16/2011	35%	0%	11/8/2013	90%	15%	6/17/2016	0%	0%
10/10/2011	0%	0%	2/10/2014	100%	10%	6/20/2016	0%	0%
10/12/2011	0%	0%	2/12/2014	0%	0%	9/19/2016	25%	5%
10/14/2011	5%	0%	2/14/2014	90%	15%	9/21/2016	0%	0%
11/14/2011	0%	0%	5/14/2014	0%	0%	9/23/2016	0%	0%
11/16/2011	0%	0%	5/16/2014	0%	0%	12/14/2016	0%	0%
11/18/2011	5%	0%	5/19/2014	0%	0%	12/16/2016	0%	0%
1/9/2012	0%	0%	8/11/2014	0%	0%	12/20/2016	0%	0%
1/11/2012	0%	0%	8/13/2014	0%	0%	3/6/2017	0%	0%
1/13/2012	40%	0%	8/15/2014	0%	0%	3/8/2017	15%	0%
4/9/2012	0%	0%	11/3/2014	70%	0%	3/10/2017	5%	0%
4/11/2012	0%	0%	11/5/2014	0%	0%			
4/13/2012	0%	0%	11/7/2014	30%	100%			
7/9/2012	0%	0%						

Normally, the “pass” concentration for a WET test is based on the “Instream Waste Concentration” (IWC) of the effluent at the edge of the “Regulatory Mixing Zone” (RMZ)³. As discussed in “[REF _Ref451784220 \h]” above, the IWC at the edge of the acute mixing zone is 13.4%. However, the current Special Condition for Formosa’s WET testing requires them to “pass” at 100% effluent. The usual reason for this is permittees voluntarily agree to 100% because they are confident they can pass and WET testing for the single, 100% concentration is less expensive compared to the tests at concentrations less than 100%.

Note that Formosa’s Outfall 001 (**0.72 mgd** daily average limit) discharges into the Delaware City Refinery’s (DCR) Outfall 001 (**452 mgd** daily average limit) discharge channel, mixing with the DCR flow before entering the Delaware River. The 13.4% IWC is conservatively stringent; it gives credit for dilution in an acute mixing zone in the Delaware River, but does not give credit for dilution by DCR’s effluent because it would not be a conservative estimate to use “zero background” for WET in the DCR effluent.

Delaware [HYPERLINK "http://regulations.delaware.gov/AdminCode/title7/7000/7200/7201.pdf"] §6.15.11 has “anti-backsliding” requirements that restrict issuance of permits with less stringent

¹ Mysidopsis bahia

² Cyprinodon variegatus

³ [HYPERLINK "http://regulations.delaware.gov/AdminCode/title7/7000/7400/7401.pdf"], §6.0, “Regulatory Mixing Zones”

requirements than the previous permits, but with some exceptions. The permit proposes to require the estimated IWC of 13.4% as the “pass” criteria for Formosa’s WET testing, based on the exception provided under RGCWP §6.15.11.3.2.1, “Information is available which was not available at the time of permit issuance (other than revised regulations, guidance, or test methods) and which would have justified the application of a less stringent effluent limitation at the time of permit issuance.”

If there is a test failure, DNREC shall evaluate the test results to determine if there is reasonable potential to cause or contribute to water quality problems in the receiving waters and establish WET limits if necessary, as specified under Special Condition no. 7 of the permit. Biomonitoring will be quarterly with a Special Condition allowing the site to request the frequency to be reduced to annually after passing four (4) consecutive quarters. A failure in annual biomonitoring will require the site to revert to quarterly biomonitoring.

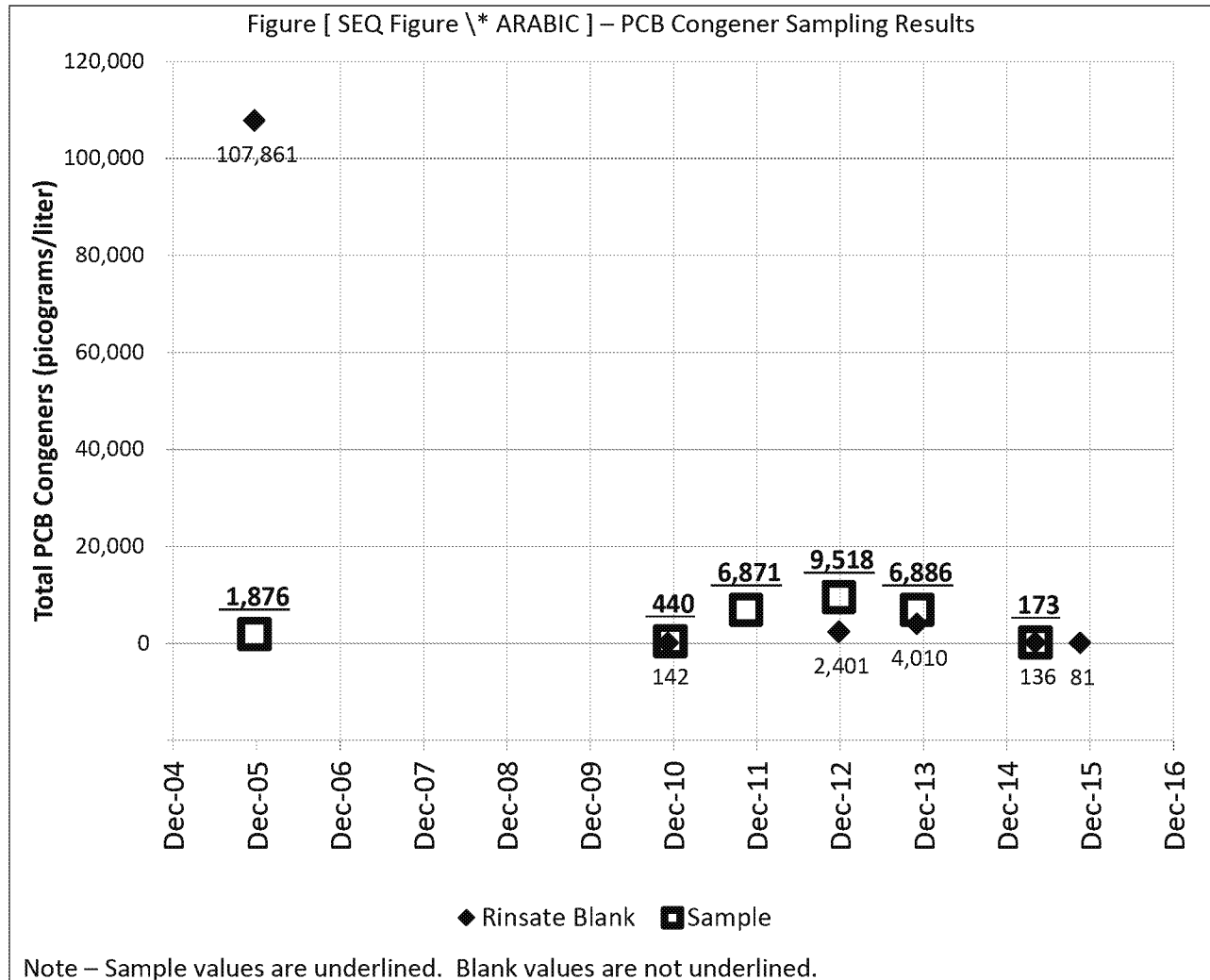
Delaware River Basin PCB Requirements

On December 15, 2003, the U.S. EPA, Regions 2 and 3, adopted a Total Maximum Daily Loads (TMDLs) for PCBs for Zones 2, 3, 4, and 5 of the tidal Delaware River. The TMDLs require the facilities identified as discharging PCBs to these zones of the Delaware River or to the tidal portions of tributaries to these zones to conduct monitoring for 209 PCB congeners, and prepare and implement a PCB Pollutant Minimization Plan (PMP).

Subsequent monitoring required by DRBC in 2005 confirmed the presence of PCBs, and indicates that this facility does not contribute to 99% of the cumulative loadings from all point sources.

In accordance with the U.S. EPA Regions 2 and 3 Total Maximum Daily Loads (TMDLs) for PCBs for Zones 2-5 of the Tidal Delaware River, the permittee submitted a Pollutant Minimization Plan (PMP) for PCBs to the Department and to DRBC in March, 2011.

The permit requires Formosa to continue to comply with the requirements of Section 4.30.9 of DRBC’s Water Quality Regulations. Special Condition No. 9 specifies monitoring requirements that are consistent with the DRBC PCB TMDL monitoring requirements.



Stormwater Discharges

The Application Form 2F reports zinc at 0.188 mg/L in the Outfall 003 storm water discharge to Dragon Run. The storm water general permit benchmark for zinc is 0.117. Zinc in storm water runoff can best be addressed through the permittee's Storm Water Plan.

Special Conditions

Special Condition No. 1 states that this permit supersedes the previous permit issued for this site (NPDES Permit DE 0000612, and State Permit WPCC 3025F/75) with an effective date of October 1, 2009.

Special Condition No. 2 addresses the DRBC's waste load allocation and its requirements of 87.5 percent BOD₅ removal in Zone 5 of the Delaware River. This Special Condition includes a new requirement for influent testing to verify that the 87.5% BOD₅ removal requirement¹ is met. This Special Condition also addresses the possibility of dilute influent, per DRBC Water Quality Regulations, §4.30.3.B.3,²

Special Condition No. 3 is also a new requirement for influent testing, but to verify that the 85% Total Suspended Solids (TSS) removal requirement³ is met.

Special Condition No. 4 specifies requirements for volatile organics testing. Provision under this Special Condition for compositing aliquots prior to analysis was originally included in this permit per EPA Memorandum, "Clarification of Sampling Procedures for the VOA Fraction".⁴

Special Condition No. 5 is a standard permit reopener clause. This Special Condition allows the Department to reopen and modify the permit if the discharge is causing water quality problems.

Special Condition Nos. 6, 7 and 8 specify acute biomonitoring requirements for Outfall 001 effluent.

Special Condition No. 9 specifies requirements for PCB congener monitoring and an ongoing Pollutant Minimization Plan (PMP).

Special Condition 10 requires the permittee to use EPA-approved analytical methods⁵ that are capable of detecting and measuring the pollutants at, or below, the applicable water quality criteria or permit limits pursuant to 40 CFR Part 136.

Special Conditions Nos. 11, 12, and 13 require proper disposal of sludge generated in the water treatment processes, recognizing the sludge as a discharge, per 40 CFR 125.3(g).

Special Condition No. 14 requires the permittee to continue to implement and maintain a Storm Water Plan (SWP) to minimize potential contamination of storm water runoff from its facility.

¹ "87.5%" is from DRBC's "Status of CBOD20 Wasteload Allocations", Table 1, Page 2, <http://nj.gov/drbc/library/documents/status-CBOD20-wasteload-alloc120601.pdf>.

² <http://www.state.nj.us/drbc/library/documents/WQregs.pdf>

³ "85%" is from the "Delaware Regulations Governing the Control of Water Pollution" (DeRGCWP), §7.1 "General", [HYPERLINK "<http://regulations.delaware.gov/AdminCode/title7/7000/7200/7201.pdf>"].

⁴ Memorandum from Geoffrey H. Grubbs, Chief, Technical Support Branch (EN-336), U.S.E.P.A. Office of Water, dated July 31, 1985, [HYPERLINK "<https://www3.epa.gov/npdes/pubs/owm0421.pdf>"].

⁵ See "National Pollutant Discharge Elimination System (NPDES): [HYPERLINK "https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&cad=rja&uact=8&ved=0ahUKEwj2tY_ajYrQAhVK7oMKHS5-A_kQFggdMAA&url=https%3A%2F%2Fwww.federalregister.gov%2Fdocuments%2F2014%2F08%2F19%2F2014-19265%2Fnational-pollutant-discharge-elimination-system-npdes-use-of-sufficiently-sensitive-test-methods-for&usq=AFQjCNG-zfsSjLPjqoGJud1CyBNjelsEzg&sig2=EtkD_AuUCkB1AhLQ-wHLBg"] for

Permit Applications and Reporting", Federal Register Volume 79, Number 160 (Tuesday, August 19, 2014), Pages 49001-49013. Also see FR Doc No: 2014-19265, EPA-HQ-OW-2009-1019, FRL-9915-18-OW, and RIN 2040-AC84.

Special Condition No. 15 outlines wastewater treatment plant operator licensing requirements for this facility.

Antidegradation Statement

The proposed effluent limitations in the NPDES permit comply with the applicable portions of the State of Delaware's *Surface Water Quality Standards*, Section 5.0, "Antidegradation and ERES Waters Policies".

Public Notice and Process for Reaching a Final Decision

The public notice of the Department's receipt of the application and of reaching the tentative determinations outlined herein will be published in the Wilmington News Journal and the Delaware State News on DATE. Interested persons are invited to submit their written views on the draft permit and the tentative determinations made with respect to this NPDES permit application. The Department will not hold a public hearing on this application unless the Department receives a meritorious request to do so or unless the notice of this proposal generates substantial public interest. A public hearing request shall be deemed meritorious if it exhibits a familiarity with the application and a reasoned statement of the permit's probable impact. The request for a public hearing shall be in writing and shall state the nature of the issues to be raised at the hearing. All comments received by the close of business at **4:30 pm on DATE+30**, will be considered by the Department in preparing the final permit.

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